

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Serial No.: 10/628,651  
Applicant: Joseph W. Harris  
Art Unit: 1793  
Title: **PHOSPHORUS-COPPER BASE BRAZING ALLOY**  
Attorney Docket: JWH-59US  
Confirmation No.: 4424

Mail Stop AF  
Commissioner for Patents  
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Alexandria, VA 22313-1450

Electronically Filed: July 8, 2008

Sir:

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Applicant requests review of the April 8, 2008 rejections in the above-identified application. No amendments are being filed herewith, and it is being filed concurrently with a Notice of Appeal.

**REMARKS/ARGUMENTS FOR REVIEW**

Claims 1, 5-7, 22, 25 and 35-44 are pending and stand rejected as set forth in the 04/08/2008 Final Office Action (the "04/08/2008 OA").

It is an error in fact to maintain rejections over the PL Abstract (PL 149319), which has been established by a preponderance of the evidence to be inoperable and to fail to teach one skilled in the art how to make a viable braze from the composition recited therein. It is further error in fact to maintain the rejections of obviousness over the various prior art combinations, as criticality has been established. It is yet further error in fact to maintain the rejections that rely upon the CN Abstract (CN 1060052) for teaching the solid components, as there is no *prima facie* obviousness.

Applicant's 12/27/2007 Response provides a summary of positions presented by Applicant throughout prosecution, as well as responses to Examiner's 06/28/07 Office Action. In addition, the Supplemental Response of 08/31/2005, Response of 02/27/2006, and Response of 08/18/2006 (entered with 10/17/2006 RCE) together with the Affidavits presented therewith provided significant data and evidence in support of both inoperability of the PL Abstract and criticality and unexpected results of the claimed invention. It is noted that the filing procedures of the PTO are such that colored photographs submitted as evidence are converted to black and white, and therefore, may not show the Panel the testing results as clearly as if the integrity of the colored photographs were maintained. Should the Panel desire to see the evidence in color, Applicant will gladly re-submit the evidence in a manner suggested by the Panel immediately upon request.

See Pages 3-4 of 12/27/2007 Response, for example, for discussion of the reasons why the PL Abstract is inoperable. Examiner's response to Applicants argument is set forth on page 7 of the 04/08/2008 OA beginning at line 3. Specifically, Examiner responds to the argument of inoperability by saying "applicant has failed to show the claimed brazing composition is critical and possesses unexpected result." First, in arguing inoperability, Applicant is establishing that the PL Abstract does not enable one skilled in the art to make and use the claimed invention. As set forth in the Third Affidavit of Robert Henson (filed 2/27/06) and the accompanying Response, as one skilled in the art, Mr. Henson attempted to practice the teachings of the PL Abstract. As set forth in great detail, Mr. Henson followed the Example provided therein and could not obtain a braze. Having failed to obtain the desired results, Mr. Henson then made certain experiments and adaptations, within the skill of the competent worker, in an effort to achieve a braze. He tried brazing the powder form. He altered the composition while staying within the broad teachings of the PL Abstract. No adaptations that a skilled worker would try resulted in a viable braze. Only the addition of a commercial flux caused any flow of the brazing alloy into the joint, but it is contrary to the teachings to use a commercial flux when a carrier is present. Moreover, a key benefit of phos-copper brazing alloys is their self-fluxing nature, such that if a flux is needed to cause the alloy to flow, the alloy is not a phos-copper alloy, by definition. The claimed alloys are phos-copper alloys, as that term is understood in the industry. If the PL Abstract is prior art for all it teaches, it teaches nothing to the skilled worker that would allow the skilled worker to achieve a viable braze, and certainly does not teach a self-fluxing phos-copper alloy. It is therefore believed that Applicant has established inoperability of the reference by a preponderance of the evidence, thereby shifting the burden to the Office to rebut. In response, the Examiner fails to address the issue of inoperability but instead switches gears to unexpected results, which is not the same issue.

Examiner further states that Applicants argument (quoted on page 7 of the 04/08/2008 OA) is "inconsistent with Table A submitted by applicant that Alloy A has liquidus temperature at 1284°F." To the contrary, Alloy A "did not begin to melt and flow until well above 1500°F." (emphasis added). Liquidus is a term for where the alloy is completely melted, but it is not a descriptive term for "flow." An alloy can melt, but not flow, in which case no braze is formed. Applicant, as well as any skilled worker, would be concerned not only with the melting of the alloy but its ability to flow into the joint, for there will be no viable braze if the alloy does not flow under capillary action into the joint. Turning to the photographs provided in the Third Affidavit of Robert Henson (filed 2/27/06), it is seen that

cohesive forces formed the melted alloy A into balls, preventing flow into the joint (color photographs more clearly illustrate the result). In other words, the surface tension was high such that the alloy did not wet the surface. Thus, while the alloy eventually melted, it did not flow and therefore, as asserted, did not form a braze at the temperature asserted by the reference or even at temperatures well above that.

On page 7 of the 04/08/2008 OA, third paragraph, Examiner responds to Applicants arguments on alloys B-E by claiming that Applicant has not provided evidence that the claimed alloy has a liquidus T less than 1410°F from end-point to end-point. Examiner then reiterates his comments on pages 7-9 of the 05/18/2006 Office Action. First, the element of a <1410°F liquidus T appears in dependent claim 5, and is thus a narrowing element to the broader claim 1. It is therefore not clear why the Examiner makes this comment. See 12/17/2007 Response, pages 10-11 pertaining to claim 5, where it is clear that the evidence provided by Applicant shows the affect of compositional variation on the temperature profile of the alloy. Applicant has enabled one skilled in the art to select the compositional elements to achieve the claimed temperature profile, while the PL Abstract provides no such teaching or suggestion. It is not asserted that all possible compositional variations from end-point to end-point will have the claim 5 temperature profile, rather it is claimed that the composition should be configure to have it, i.e., the amounts should be selected to achieve it, and it is within the skills of the ordinary worker to ascertain whether the claimed temperature profile is achieved in view of the specification and without undue experimentation. Examiners comment is thus nonsensical and irrelevant to the patentability of claim 5. Second, in the Response of 08/18/2006 (entered with 10/17/2006 RCE) (pages 7-8) together with the Affidavit presented therewith, Applicant addressed the comments of Examiner made in pages 7-9 of the 05/18/2006 Office Action, and yet Examiner reverts back to those comments without regard to Applicants subsequent response.

Examiner then says, on Page 7 again, "none of the independent claims cited Sn+Sb limit (i.e.,  $Sn+Sb \leq 10$ ). Actually, independent claims 35 and 39 contain the very limitation that Examiner says is not present, and Applicant added dependent claims 43 and 44 depending from independent claims 1 and 22, respectfully, reciting the limitation. And yet, claims 35, 39, 43 and 44 remain rejected without justification as to how that limitation is taught or suggested by the cited art.

At the top of Page 8 of the 04/08/2008 OA, Examiner quotes language from the Second Affidavit of Robert Henson (submitted 08/31/2005) and underlines the solidus temperature, then asserts

that it proves that the claimed liquidus temperature is met! This is an error in fact.

In the 2<sup>nd</sup> paragraph of Page 8 of the 04/08/2008 OA, Examiner says "the claimed 'about 9 wt.%' is '11wt.%.'" This statement makes no sense. In the paragraph spanning pages 6-7 of the 12/27/2007 Response, Applicant set forth the test results when the phosphorus content is just above or just below the claimed range to show criticality of the claimed range.

In the 3<sup>rd</sup> paragraph of Page 8 of the 04/08/2008 OA, Examiner question why solder alloys cannot be used for brazing, and points out that there are no tensile properties claimed. As has been repeatedly stated by Applicant, BY DEFINITION, a solder is an alloy that has a liquidus below 840°F. Applicant claims brazing alloys that have a liquidus above 840°F. So NO, a solder cannot be used for brazing because it melts below the temperature that by definition it must not melt below to be a brazing alloy. Applicant does not understand Examiners point with respect to the tensile properties, as this comment seems to come from far left field. Examiner then says that the solder alloys are substantially the same as the claimed brazing alloy. No, actually, the solder alloys contain additional elements that effectively lower the liquidus temperature and provide greater ductility to the alloy.

In the 4<sup>th</sup> paragraph of Page 8 of the 04/08/2008 OA, Examiner states that Applicant has not shown any essential element from the CN Abstract that would affect the characteristic of the claimed brazing alloy. The reference itself admits of the material effect. A low temperature solder and a middle temperature solder are each provided, with the variation being in the amount of phosphorus, zinc and copper. The reference inherently admits that adjusting composition alters the temperature profile.

In the last paragraph of Page 8 and the 1<sup>st</sup> paragraph of page 9 of the 04/08/2008 OA, Examiner asserts that claims 5 and 7 are unpatentable because Alloys A (corresponding to the example in the PL Abstract), C and D have the claimed liquidus or thermal arrest temperature. However, Alloy A has P content far below the claimed range and a Sn content far above the claimed range, and thus does not teach or suggest the claimed invention. In addition, Alloy A has been established by a preponderance of the evidence to be inoperable. Similarly, alloys C-D have P or Sn contents outside the claimed range. Analysis should focus on the claim as a whole, and Examiner is picking the claim apart finding one element in the art while ignoring the failure to teach or suggest the other limitations. Alloys, in particular, are quite synergistic, as explained quite clearly throughout the specification and the prosecution, such that while one limitation may be met, if another isn't, the net effect may be unsuitability as a brazing alloy. Examiner is thus cautioned against this picking apart of the claims in an

attempt to defeat patentability.

In the 2<sup>nd</sup> paragraph of page 9 of the 04/08/2008 OA, with respect to the  $\text{Sn+Sb} \leq 10$  limitation in claim 43, Examiner says "But, alloy A has Sn+Sb over 10wt.%" Exactly! And it couldn't be processed into a solid component because of it. Examiner says Alloy F does not make clear that the Sn+Sb content is the problem because applicant failed to keep other elements the same. Applicant tested Alloy F such that all elements are within the claimed range except the combined Sn+Sb content, thus clearly showing that element is the factor.

Regarding Examiners assertion that Applicant has failed to show criticality from end-point to end-point, Applicant disagrees. Applicant varied the various compositional elements and performed testing just outside the claimed limits. There is a mountain of evidence set forth in the prosecution of this application, and yet Examiner discounts it with conclusory statements. Applicants have attempted to address Examiners comments with a significant amount of testing, only to have the evidence nit-picked on the basis of what it apparently does not show without regard to what it does show. Applicant is, and always has been, able and willing to provide evidence if only it were clear what could possibly be provided that would make a difference. It is apparent that no amount of evidence will seem to be sufficient in this case when the only response to its submission is to disregard it as insufficient.

With respect to the last paragraph on page 9 of the 04/08/2008 OA, if the reference is analogous art, then if the In addition affects the reference alloy, it will likewise affect the claimed alloy, and this would be obvious to one skilled in the art.

With respect to Joseph, Applicant claims specific solid components, none of which are taught by Joseph.

Hence, Applicant respectfully asserts that the rejections are plainly in error, and Applicants should not be forced through the time and expense of a full-blown appeal.

Respectfully submitted,

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